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**CIRCULAR NO. 1/2004/G1**

Sub: Soil and Moisture Conservation works - Treatment of watershed - Saturation level treatment -An instrument for alleviation of poverty and increase of green cover -certain guidelines issued -Reg.

- Ref: 1. Prl. Secy to Government (W&P) Fin Dept Memo No.17607/250/RIDF/WA-I/2004, Dt. 28.7.04
2. Circular 5 & 5A/2002/PMU I/3 communicated in P.C.C.F Ref. NO.17309/2000/PMU I/3, Dt. 23.8.2002.
3. Circular 2/J4/2004 communicated in Ref. No. 16284/2003/J4, Dt. 8.3.2004.
4. Circular No. 6/2003/PMU HI/2, communicated in ref. no.4483/2002/PMU MI/2, Dt. 15.7.2003

The Government of Andhra Pradesh has taken up massive Watershed Programme since May 2000 giving a lot of importance to the Community Participation in order to conserve the scarce water resource. With a view to increase the crop yield and greenery in the state which would, there by, result in alleviation of poverty & all around economic development, the department has taken up SMC works under RIDF, APCFM project & FDA in the form of Continuous Contour trenches (CCTs), Staggered trenches, Rock Fill Dams, Check Dams, Percolation tanks etc.

Certain guidelines have already been issued in the references cited 2<sup>nd</sup> to 4<sup>th</sup> cited. The progress achieved in this regard is satisfactory but in no way commensurates with the problem and therefore we find only few perennial percolation tanks in the discharge area. If the SMC work is done properly or the watershed is treated to the saturation level, the last percolation tank in the discharge area has to be perennial necessarily.

Since the water is the starting point for development it has therefore been decided to treat the watershed to saturation level necessarily instead of doing the SMC works in a fragmented or piecemeal basis.

Often doubts have arisen regarding quantum of earth work to be done to achieve saturation level treatment in a watershed. To arrive at this, the riparian rights of farmers under the existing tanks have to be taken into consideration also. The technical committee set up at water conservation mission recommended that 25% of the yield of existing rains can be tapped in the watershed for equity considerations of people living on ridge portions. Taking the run-off as 40% of total rain fall, this will allow extra impounding of 10% of precipitation. Soil moisture regime remaining same, this will result in more than doubling the percolation of water in the treated watershed (at present

percolation is about 9% of total rain fall in the state). To give more clarity to this concept the following model calculations are given:

Depending on rain fall areas can be categorized into 3 categories, category A areas with annual rainfall more than 900 mm, category B areas with annual rain fall 600 mm-900 mm and the category C areas with rain fall less than 600 mm. Area of micro-watershed which is the basis for saturation level treatment varies from 400 ha. to 1000 ha. For the purpose of model calculations the area of watershed is taken as 500 ha. In category A areas 10% of precipitation which is intended to be impounded amounts to 4,50,000 cum of water. In categories B & C this will be 3,00,000 cum. In high rain fall zones, as run-offs will be substantial preference should be given to percolation tanks and in low rainfall zones SMC works like CCTs, SGPs and staggered trenches should be given preference. It can be safely presumed that 1cum of earth work for PTs will give 25 cum of water impounding in a year taking 5 fillings for the PTs annually. CCTs, staggered trenches, taking 10 fillings annually will result in annual impounding capacity of 10 cum of water for 1 cum of earth work done. For impounding 4,50,000 cum of water impounding in category A watersheds, planning should be done to impound 3,50,000 cum through PTs and the rest through trenches. This can be achieved by taking up SMC works i.e., 14000 cum earth work for PTs and 10,000 cum earth work for trenches. In category B & C watersheds 1,00,000 cum of water can be impounded by PTs which require 4000 cum of earth work and 200000 cum of impounding capacity through trenches which require earth work of 20000 cum. For all type of watersheds it can be seen that roughly 24,000 cum of earth work is required to be done to create SMC structures to impound additional 10% of annual precipitation in a watershed of 500 ha. area.

It is desirable that some of the water harvesting structures serve dual purpose. As already instructed in circular No.2/J4/2004 some of the CCTs can serve the purpose of fire lines. For this purpose the dimensions given in the circular should be followed and for locating such fire lines cum CCTs the fire risk zonation done by GIS wing should be used.

The following operational instructions are given for implementation of saturation level treatment concept.

### **1. Location of Site:**

Suitable location for construction of various water harvesting structures are to be identified first and their prioritization as per the local importance and feasibility using the Beat maps prepared for WHS has to be done as per the guidelines supplied by the Geomatic centre in P.C.C.F. Ref. No. 14827/2003/GIS, dt. 14.5.2003 (Copy enclosed).

The treatment should be done on watershed basis. While sanctioning the projects NABARD has given either Range as a unit or the area with VSS as a unit in case of JFM trenches. It may not be possible to completely treat the area with the available project components. Usually the area of Range falls in more than one micro- water shed (area is around 500 ha). Water shed boundaries layer is available with GIS wing and by superimposing the compartment layer we can know the list of compartments falling in particular water shed. While selecting a watershed, priority should be given to watersheds in ridge portion which are more prone to erosion of soil. Once the priority

water shed is demarcated on the ground and marked on the Beat maps, all stream should be identified. The water flow streams may be of 1<sup>st</sup> order, 2<sup>nd</sup> order, 3<sup>rd</sup> order etc. Once the streams are identified in the water shed, action should be taken from the 1<sup>st</sup> order stream for harvesting of available rain water by suitable Water harvesting structures.

Exact location of water harvesting structures can be decided after actual field inspection of the site after reaching the probable location given in GIS WHS maps by use of GPS. VSS/ User groups should be fully involved in selection of the site. A team consisting of Ground Water Dept., Irrigation Dept. and FD officials should finally select the sites after considering technical feasibility.

If the area of watershed is totally covered by CFM/FDA, funds from these programmes should be used to saturate the watershed. In case of watershed, where part of the area is covered by the CFM/FDA, works in the area falling under jurisdiction of VSS should be carried with CFM/FDA funds and balance area of watershed with RIDF by executing the works through the VSS to saturate watershed.

## **2. Technical guidelines :**

The structures taken up should be as per the guidelines and drawings given by Prof. T. Hanumanth Rao, chairman technical Committee in his four water concept book. As far as possible, cement structures should be avoided (Check-dams) as they are not cost effective for the purpose of percolation of water. While forming PTs simple details like maintaining the side slopes of bund, consolidation of the bund by roller and maintaining the section of the bund as per the drawing should be given importance. Care should be taken to see that the top width of the bund is not more than that specified in the drawings. The length and height of by- wash should be planned as per the ready reckoners available in Four waters concept of Sri T. Hanumantha Rao sunken CCTs/STs must be provided with Septa at regular intervals. The width of the Septa should not be less than 1 m which may be increased to 1.5 m in case of soft sandy soils. It's very important to give sides slopes of at least 1:1 in soft soils and 1/2:1 in case of hard soils to the trenches. The dug-out soil should be deposited at least 1 m away from the trench and trapezium shape should be given to the dug-out soil so that seed sowing can be taken up on this dug-out soil.

The instructions given in Circulars 5 & 5 A of on saturation treatment of watershed should be followed scrupulously. As suggested in the circulars, a series of mini PTs and SGPs should planned on 1<sup>st</sup> and 2<sup>nd</sup> order steams. If the gradients are more than 3%, CCTs will be effective. Toward the end of the water shed bigger PTs can be planned. The whole exercise should result in at least one PT in the treated area becoming perennial and the streams in the watershed support minimum flows even during non-monsoon months.

## **3. Method of Execution:**

No Contractor shall be engaged or assigned or nominated in execution of these works. Works shall be carried out through User groups (VSS) by depositing money in joint account as is being done in implementation of CFM. Even in non-JFM trenches, works should be entrusted to near by VSSs and if no such VSSs are available, efforts should be made to form new ones and then start the work. No machines should be

engaged to carry out works as one of the objectives of the scheme is to give wage employment to local people during lean seasons. Government instructions given in this regard from time to time should be followed.

#### **4. Training & Capacity Building:**

Though VSS is a cohesive group of families living near the forest, a core group of 15 - 20 young and enthusiastic members within the group should be identified and trained in various aspects of the Forest Management. The entire exercise of identification of the core groups and their training must be accomplished and internalized within the shortest possible time. The guidelines issued in P.C.C.F. Ref. No. 4483/2002/PMU III/3, dt. 15.7.03 may be followed.

#### **5. Safeguards:**

Payment to the works should be done only after recording the works and checking for technical adherence as per the work order. The recording and test checking officers will be held responsible for deviations, if any, found later. Necessary redeployment of man power shall be done for effective supervision and implementation of the project. Priority should be given to predominantly tribal/agency areas for implementation of the project. Execution of works should be done strictly as per the sanctioned estimates. The progress of work should be closely monitored by Range Officer and reviewed every quarter by the DFOs and CFs. Display boards should be installed at every treatment area duly giving the details of the Project.

As and when the work is completed, a project completion report along with photographs of major items of works depicting pre-project and post-project situation and Geo-referenced maps should be sent. Normally this should not take more than 15 days time from completion of the project.

Sd/- **(S.K. DAS)**  
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